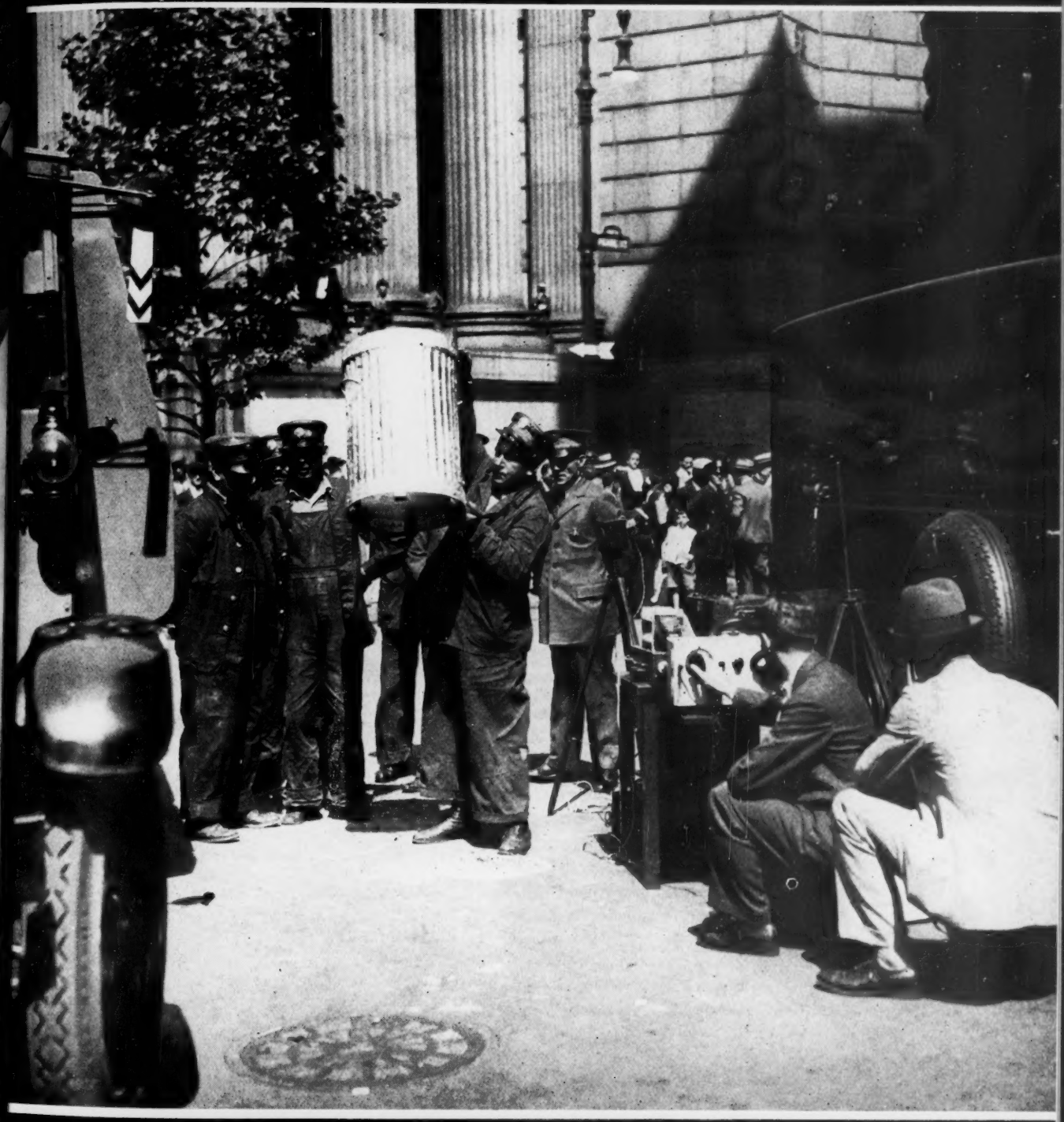
Industrial Standardization

and Commercial Standards Monthly



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APRIL 1936

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ASA Committee Has Broad Program For Measuring and Labeling Sounds

by

Vern O. Knudsen[1]

Chairman, Sectional Committee on Acoustical Measurements and Terminology

Motion Picture, Radio, Building Materials, and Auditory Appliance Industries Will Benefit from Work of Committee Directed by Acoustical Society of America

UNTIL recently, the doctor measured our hearing, or lack of it, with a ticking watch, with some whispered numbers, or with a few spoken words. These tests may suffice for detecting gross impairments of hearing, but when measurements in the acoustical laboratory show that the "sound intensity" of one watch tick is 100 times greater than that of another, and that the acoustical power of different speakers varies over a range of more than a hundred-fold, it is evident that we need better sources of sound, and better standards for measuring sounds.

During the past twenty years we have witnessed an unparalleled development in applied acoustics. The phenomenal growth of radio and the revolutionary effects of adding sound to motion pictures have done much not only to accelerate this development but also to build up a sound-conscious public. Social and civic organizations became interested not only in better sound but also in less noise. It became apparent that noise reduction was beneficial not only to the preservation of good health but also to the promotion of good

A basic standard for the measurement of sound is as fundamental in the control of noise as are basic foot and pound reference standards in the control of length and weight. Such a standard has just been established for the first time through the work of an American Standards Association committee, directed by the Acoustical Society of America.

Measurement of sound is the first step in the control of noise. The approval by the American Standards Association of the American Tentative Standards for Sound Level Meters (Z24.3-1936) and the American Tentative Standards for Noise Measurement (Z24.2-1936) eliminates the element of chance in determining how loud a sound actually is.

The standard loudness "reference level" provides a basic unit as a starting point from which all sound can be measured.

The standard for meters makes it possible to obtain the same results for the same sound when measured by any type of standard meter.

The three following articles tell about the work of the American Standards Association committee on Sound Measurement, and describe the two new standards on Sound Measurement and Sound Level Meters.

[1]University of California at Los Angeles.

Manufacturers, Musicians, Engineers Develop Noise Meaurement Standards

Manufacturers of electrical appliances, radios, and telephones, musicians, motion picture and automobile engineers, and engineers interested in the general problem of sound and its relation to efficiency and health are members of the Sectional Committee on Noise Measurement which is working on a series of standards under the procedure of the American Standards Association. The new standards on Sound Meters and Sound Measurement were prepared by a subcommittee of this general sectional committee. It is the first and basic standard on which the work of the sectional committee will be developed.

Members of the sectional committee are:

V. O. Knudsen*, Acoustical Society of America, *Chairman

J. W. McNair*, American Standards Association, *Secretary

Acoustical Society of America, *Dr. Harvey Fletcher, H. A. Frederick, Prof. V. O. Knudsen, Prof. D. C. Miller*
Acoustical Materials Association, *John S. Parkinson, Wallace Waterfall*
American Gas Association, *Dr. F. E. Vandaveer*
American Institute of Electrical Engineers, *P. L. Alger, C. R. Hanna, Bassett Jones, Prof. B. F. Bailey (alt.), Dr. Ellsworth D. Cook (alt.), Prof. H. M. Turner (alt.)*
American Institute of Physics, *Dr. Henry A. Barton*
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Music Industries Chamber of Commerce, *Paul H. Bilhuber*
National Association of Fan Manufacturers, *A. A. Criqui, J. L. Lennon (alt.)*
National Electrical Manufacturers Association, *L. W. Chubb, A. Pinto, J. J. Smith, C. R. Boothby (alt.), J. A. Jackson (alt.), H. M. Williams (alt.)*
Radio Manufacturers Association, Inc., *Hans Roder*
Research Council of the Academy of Motion Picture Arts and Sciences, *Nathan Levinson*
Society of Automotive Engineers, *R. F. Norris, Stephen J. Zand*
Society of Motion Picture Engineers, *Franklin L. Hunt, S. K. Wolf*
Telephone Group, *R. G. McCurdy, A. F. Rose (alt.), W. H. Martin, Dr. Arthur Bessey Smith, R. H. Manson (alt.)*
U. S. Department of Commerce, National Bureau of Standards, *V. L. Chrisler*
U. S. Navy Department, Bureau of Engineering, *Officer in Charge, Design Division, Specification Section, Bureau of Engineering; Laboratory Officer, Material Laboratory (alt.)*
U. S. War Department, *Leon E. Ryder*
Members-at-Large, *F. A. Firestone, P. E. Sabine, Leopold Stokowski, Wallace Waterfall, F. R. Watson*

economy. Workers in quiet surroundings were found to do more and better work than those in noisy surroundings. The acoustical treatment of offices, restaurants, and theatres was found to be an investment which would often yield more than ten per cent.

Noise reduction and acoustical treatment were off to a flying start, and they fared relatively well right through the depression. The need for a meter which would register the loudness, or noisiness, of a noise became urgent. Several meters, employing microphones, vacuum tube amplifiers, and indicating or recording devices, were developed by some of our leading electro-acoustical concerns. But measurements of the noise of motors, vacuum cleaners, automobiles, or airplanes obtained with one meter rarely agreed with the measurements obtained by another meter.

Appeals were made to the American Standards Association to call together the experts on sound. The ASA responded immediately, and in January, 1932, organized a Sectional Committee on Acoustical Measurements and Terminology under the technical direction of the Acoustical Society of America. The immediate problem before the committee was the standardization of units, scales, and instruments for the measurement of noise, but it realized the necessity of extending its scope to other acoustical matters, such as terminology and definitions, fundamental acoustical measurements, and sound absorption and insulation. More recently, it has extended its scope to include the

standardization of instruments for the measurement and correction of impaired hearing. Standards prepared by two of the subcommittees working on these projects have just been approved by the American Standards Association.

The Subcommittee on Acoustical Terminology, of which H. A. Frederick is chairman, has made a very important contribution to acoustics in the standardization of acoustical nomenclature and definitions. The committee has proposed definitions for more than 150 of the most widely used terms in the general field of acoustics and in such specialized fields as architectural acoustics, hearing, music, acoustical and electro-acoustical transmission systems, and acoustical instruments. These definitions have been widely circulated, not only in this country but in several foreign countries, and already have exerted a powerful influence on the standardization of acoustical terms used by nearly all contributors to technical publications on acoustics. This proposal is now receiving final consideration by the Acoustical Society of America before being submitted to the ASA.

The work of the Subcommittee on Noise Measurement, of which Dr. Harvey Fletcher is chairman, has contributed immensely to the standardization of noise measurements. The American Standards Association has just approved as American Tentative Standards for Noise Measurement a system of units, scales, definitions, and general conditions which will govern the measurement of the loudness level of all types of sound.

The Technical Committee on Sound Levels and Sound Level Meters, of which R. G. McCurdy is chairman, has prepared a set of Tentative Standards for Sound Level Meters which specify the physical characteristics and methods of calibration of these instruments for the measurement of the levels of noise and other sounds, which have been approved by the American Standards Association.

The Subcommittee on Fundamental Sound Measurements, of which C. R. Hanna is chairman, has made important progress on the standardization and calibration of microphones. These standards, when approved, will be of importance not only to the work of the other subcommittees, but will have significance in the whole field of radio broadcasting and the recording of sound for motion pictures.

The newly organized Subcommittee on Audiometers and Hearing Aids is entering upon a work of standardization which should prove very helpful to the several millions of our population who suffer from impaired hearing and who require mechanical aids to hearing. At present, the medical profession uses instruments for measuring defects of hearing which are either unsatis-

Using Sound Level Meters to Measure the Noise of a Busy City Street

Courtesy Johns-Manville Co.

factory or inadequately standardized. It is almost universally true that hearing aids are sold without certificates or quantitative data describing the type and amount of amplification which will be obtained from the use of these aids.

Standardization in acoustics is thus seen to be a problem of more than academic interest. It is a practical necessity.

American Standard for Measuring Noise Establishes Standard Reference Systems

by

Harvey Fletcher[1]

Chairman, Subcommittee on Noise Measurement

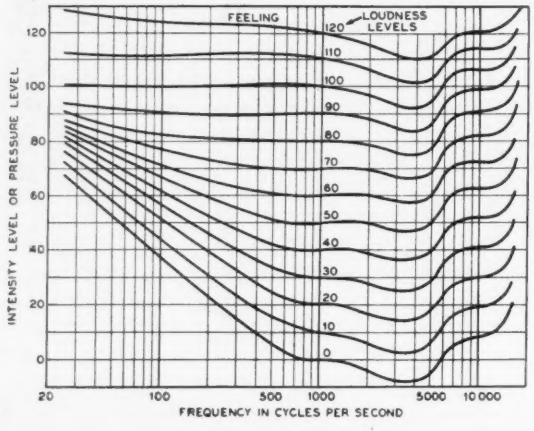
"Reference Level" Sets Starting Point for Measuring Sound, as "Sea Level" Does for Altitude

Committee Decides on "Decibel" (Common Unit in All Sound Work) and "Loudness Unit" to Express Loudness of Sound Measured

THERE is a growing public consciousness that noise is not a necessary evil but that it can be controlled and abated. In recent years numerous noise abatement commissions and societies for the prevention of noise have sprung up both in this country and also in Europe. Everywhere people are demanding that the places where they are required to live, work, play, and sleep, be less noisy. Our mechanical age is responsible for a large part of the increase in noise, but the noise problem cannot be considered new because it has existed to some extent for ages past. It is obviously impossible, if not in fact undesirable, to make our environment completely soundless. It is certain, however, that much can be accomplished in the way of noise reduction.

Figure 1

Curves Showing How the Intensity Level of Pure Tones of Different Frequencies Must Be Changed to Maintain a Given Loudness Level



As a first step in planning noise reduction it is desirable to establish loudness standards and to determine just how loud a noise must be to be considered objectionable. Thanks to the tremendous development of telephony, radio, and sound pictures during the last few years, sound intensity can now be measured accurately. With experimental tools has come a precise language for talking in a quantitative way about noise.

But, although the physical characteristics of a sound can be measured, its loudness depends on the judgment of observers. The judgment of these observers depends upon so many characteristics that a large number of different opinions must be recorded and averaged, and some references must be established for guidance, if the results are to be coherent. In the American Standard for Sound Measurement just approved by the American Standards Association not only the language to be used to specify loudness but also methods of measurement are described.

---

[1] Bell Telephone Laboratories, New York.

Prominent Technical Men Developed Standard for Noise Measurement

The subcommittee which prepared the American Standard for Noise Measurement is made up of technical men of prominence in their fields. They are:

Harvey Fletcher, Bell Telephone Laboratories, *Chairman*
V. L. Chrisler, National Bureau of Standards
E. E. Free, New York
C. R. Hanna, Westinghouse Electric & Manufacturing Co.
H. B. Marvin, General Electric Company
R. F. Norris, C. N. Burgess Laboratories
F. A. Firestone, University of Michigan
J. S. Parkinson, Johns-Manville Corporation
J. C. Steinberg, Bell Telephone Laboratories
Wallace Waterfall, Acoustical Society of America
S. K. Wolf, Electrical Research Products, Inc.
R. G. McCurdy, Bell Telephone Laboratories
Ellsworth D. Cook, Haddonfield, N. J.

Some physical quantities, such as weight or length, are stated as so many pounds or feet added to nothing at all. However, such a quantity as altitude is measured as so many feet above a reference level, usually sea level. Intensity level is like altitude and is most conveniently stated as so many units above a value arbitrarily chosen as "reference level". The unit chosen for indicating the difference between a given intensity level and reference level is the "decibel."

While intensity level is a physical quantity, the loudness of a sound depends on the ear and on the observer's judgment. To guide this judgment a reference tone has been selected and loudness has been defined. By definition, the loudness level of any sound is the intensity level of an equally loud 1000-cycle reference tone. By making such comparisons with the 1000-cycle reference tone, the loudness levels of pure tones having frequencies and intensities throughout the audible range were measured. The results are shown in the curves of Figure 1. The curve marked "0" represents the faintest sounds that can be heard and the one marked "120" the loudest that the ear will tolerate. Referring to the "0" loudness curve it is seen that as the frequency decreases from 1000 cycles, more and more intensity is necessary to make the sound audible. On the other hand at higher levels, for example 90 decibels, sounds are almost equally loud as the frequency is decreased.

Among several practical uses for these curves may be noted the case where a particular noise is compared to a tone of, say, 100 cycles. If the intensity level of this tone were found to be 58 to sound equally loud to the noise, then following the curve to the right shows the loudness level to

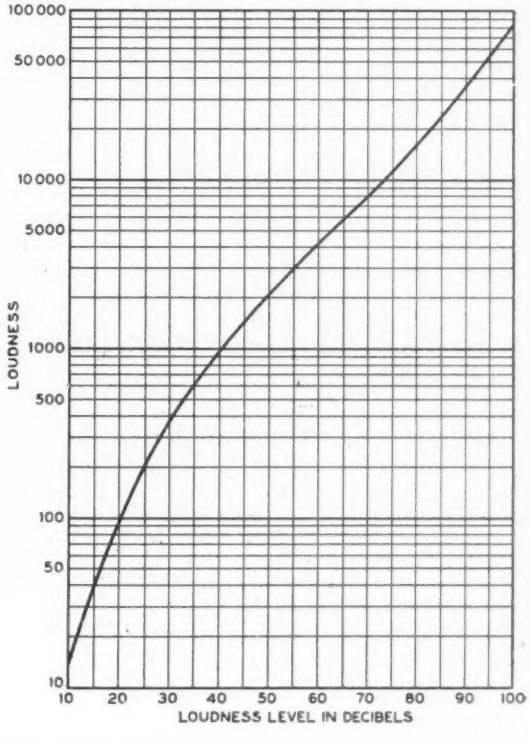
Table 1

Loudness of Typical Noises

Noise Source	*Distance of Listener*	*Loudness Level*	*Loudness*
Threshold of Pain	—	126 db	1,000,000
Airplane	18 feet	123 "	700,000
Hammer on Steel Plate	2 "	120 "	550,000
Riveter	35 "	105 "	140,000
Elevated Train	20 "	95 "	60,000
Heavy Street Traffic	50 "	85 "	25,000
Average Motor Truck	30 "	80 "	17,000
Average Automobile	30 "	70 "	8,000
Conversation	3 "	65 "	6,000
Quiet Automobile	30 "	56 "	3,000
Loud Whisper or Soft Voice	2 "	45 "	1,500
Suburban Street (No traffic)	—	36 "	700
Average Whisper	2 "	28 "	300
Rustle of Leaves by Gentle Breeze	—	16 "	50
Noise of Ordinary Breathing	1 "	10 "	14
Threshold of Hearing (In soundproof booth)	—	0 "	1

Figure 2

The Curve Shows the Relation Between Loudness as Measured in Loudness Units and the Loudness Level Measured in Decibels



be 30 decibels. Thus we see that by using this set of curves any pure tone can be used for finding the loudness level of a noise.

Although loudness level values define precisely the loudness of any sound, the numbers on such a scale do not correspond to the relative loudness that is experienced by most people.

If you give a person the reference standard and ask him to turn the dial until the loudness of the sound has been doubled, how many db will he change it? To get an answer to this question large numbers of observations on such judgments were taken, both in this country and in England. In the intensity range where most noises were heard, it was found that the intensity level of the reference tone was increased about ten db to produce double the loudness. Judgments were taken to find the changes in intensity level corresponding to ½, ¼, 1/10, and other changes of loudness. In this way the relationship between loudness and loudness level has been found. It is shown by the curve of Figure 2. This relationship has also been accepted as a tentative standard.

To illustrate further the meaning of loudness and loudness level when applied to practical problems, Table 1 on page 75 shows the loudness of noises which are familiar to most everyone. It will be seen that the loudness values range from one to one million corresponding to a loudness level range of about 126 db.

It is expected that the adoption of these standards will make it possible to write more definite specifications regarding noise conditions, which in the end must also bring about a desirable reduction in noise.

Same Sounds Show Same Loudness When Meters Are American Standard

by

R. G. McCurdy[1]

Chairman, Technical Committee on Sound Levels and Sound Level Meters

Complex Problems in Measurement of Loudness Bring Demand for Electrical Measuring Devices

Need for Comparison of Measurements Makes Standardization of Meters Essential

FUNDAMENTALLY, the human ear must be the judge of the amount of noise which can be tolerated under a given set of conditions. However, individuals differ among themselves in their appreciation of loudness and in their reaction to various sounds, so that it is generally necessary to assemble a considerable number of observers when measurements are made by methods using the ear and human judgments. Thus a strong demand was created for physical apparatus which would measure loudness or something related to loudness as an aid in determining tolerable limits for noise or other sound magnitudes.

A number of different types of noise meter were designed by different investigators working in this field of noise measurement and were built up and marketed by the different manufacturers.

Recognizing the advantages of standardizing the various meter characteristics so that the same number would be produced for a given noise, whether measured by one manufacturer's instrument or another's, the sectional committee appointed a technical committee to go into this matter. This technical committee was composed of representatives of the various meter manufacturers and representatives of important classes of users of such instruments.

The committee has now completed this phase of its work and has recommended Tentative Standards for Sound Level Meters, which have just been approved by the American Standards Association. Since instruments of this type measure the level of any sound, whether or not characterized as unwanted, or noise, the broader title of "Sound Level Meter" is used rather than the

[1]Bell Telephone Laboratories, New York.

more restricted one of "Noise Meter" or "Noise Level Meter."

It should not be thought that measurements of noise or other sounds by these meters will necessarily agree with measurements of loudness which may be made by the ear-comparison methods conforming to the standards for this type of measurement also just adopted by the American Standard Association.

The perception of loudness, and the judgment as to whether a given noise is or is not more disturbing than some other noise, is a complicated physiological and psychological reaction of human beings. It is probably too much to expect to be able to build all of these reactions into an electrical circuit. On the other hand, individuals differ among themselves as to judgments of loudness or of disturbance created by noises of different types so that usually it is necessary to assemble a "sound jury" made up of a large number of individuals in order to obtain reliable results.

Meters have the advantage of ready portability, possibility of taking a large number of measurements in a short time, and assurance that the same noise will be measured the same at different times. It is believed that meters of different manufacture, built and calibrated in accordance with these standards, will agree among themselves and that the same number will be obtained for a noise irrespective of whose meter is used in the measurement.

The essential parts of a sound level meter are the microphone, weighting network, amplifier, and indicating instrument. The microphone converts some of the acoustic energy in a sound field to electrical energy. The ear is capable of hearing a wide range of frequencies (about 40 to 16,000 usually) and these do not all sound equally loud when their acoustic pressures are the same. It is, therefore, necessary to provide a weighting network to attenuate the electrical energy corresponding to certain frequencies relative to that for other frequencies, in oder to bring the loudness shown by a meter into accord with the perception of loudness characteristic of the ear. The weightings which are being standardized for sound level meters are shown in Figure 1. Flat weighting is also permitted. The amplifier raises the level of the weighted powers until their sum is sufficiently large to cause a deflection of an electric meter. On account of the tremendous range of powers which the ear can perceive but which can not be accommodated on the scale of any simple electric meter, an additional control is usually used to keep the meter needle on the scale.

The meter measures the sound levels in decibels, using as a reference an acoustical power of 10^{-16} watts per square centimeter at 1000 cycles in a free progressive wave. This reference sound is about the weakest sound that can be detected by a person with hearing somewhat more acute than normal.

The control dial of a sound level meter is usually marked in steps of 5 or 10 decibels, and the indicating instrument is also marked in decibels so that the sound level is commonly deter-

Levels of Common Sounds
(Decibels referred to 10^{-16} watts per sq cm at 1000 cycles)

OVERALL FREE FIELD FREQUENCY RESPONSES AND TOLERANCES FOR SOUND LEVEL METERS

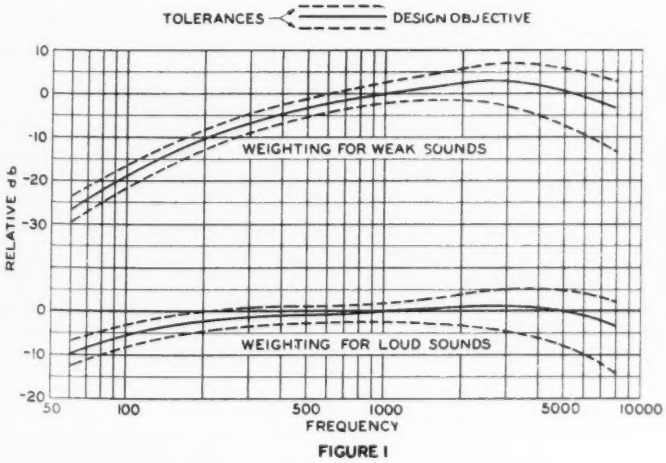


FIGURE 1

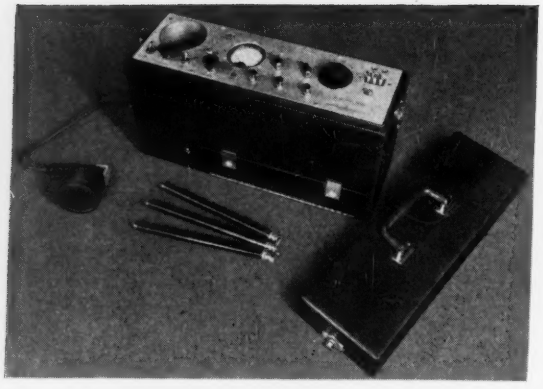


Figure 3
Typical Sound Level Meter

mined by adding the reading of the control dial to the reading of the indicating instrument. The indicating instrument itself is designed so that the time required to attain any given deflection is about equal to the time required by the human ear to fully appreciate the sound causing the deflection.

In recent years many investigators have made measurements of a wide variety of sounds with sound level meters having characteristics corresponding closely to those given above. The chart, Figure 2, shows the levels of some common sounds obtained from these investigations.

A photograph of a sound level meter capable of giving results like those in the chart in Figure 2 is shown in Figure 3. These meters are designed to be portable, being usually contained in one or two suitcase-like units.

Experts Prepared Standard For Sound Level Meters

A subcommittee of experts was responsible for developing the new American Standard for Sound Level Meters. Members are:

R. G. McCurdy, Bell Telephone Laboratories, *Chairman*
J. M. Barstow, Bell Telephone Laboratories, *Secretary*
T. G. Castner, Bell Telephone Laboratories
W. F. Diehl, RCA Victor Company
E. E. Free, New York
C. R. Hanna, Westinghouse Electric & Manufacturing Company
H. E. Kent, Edison Electric Institute
H. W. Lamson, General Radio Company
H. B. Marvin, General Electric Company
H. S. Read, S. S. White Dental Manufacturing Company
E. J. Abbott, Physicist, Research Corp.
Stephen J. Zand, Society of Automotive Engineers

Finds Factory Lighting Below American Standard Requirements

Giving credit to the work of the American Standards Association, the *Sight-Saving Review* of December, 1935, says:

"Lighting conditions and equipment in 32 clothing factories, in Connecticut, employing slightly more than 2,600 women and girls, were studied to determine the effect of light on the health and efficiency of women workers. Although meter readings were taken at a time of day that workers had maximum benefit of natural illumination, 91 per cent of the readings fell considerably below the 25-foot candle level recommended by the American Standards Association for sewing on dark cloth. On cloudy days, all readings fell below it. Nearly half of the readings, taken on sunny days, failed to reach even 10 foot candles. Not only was the lighting of the factories insufficient, but the fixtures—ranging from a bare drop light to lamps in tin reflectors—were poorly spaced, and productive of glare. In some cases workers had improvised shades; in one factory, girls said that they often sewed in the dark rather than endure the glare of the light."

ASA Approves Standard Analysis of Steel

The Recommended Practice for Thermal Analysis of Steel (A.S.T.M. E 14-33) has been approved as Amercan Standard with the designation Z30.2-1936). This standard was developed by the American Society for Testing Materials' Committee E-4 on Metallurgy, whose comprehensive membership includes a cross-section of those interested in metallographical problems.

Copies are available from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, at 25 cents each.

Japanese Exporters Want Standards for Packing

Leading exporters and shipping companies of Japan have requested that the Japanese Government take positive steps toward the standardization of packing methods for export goods, according to the *Japan Chronicle*, February 20.

The Department of Commerce and Industry is now studying the advisability of improving the methods usually adopted by Japanese exporters in packing their goods. Japanese articles are often received by overseas buyers in a damaged condition, and complaints or suggestions are being received almost daily.

Chemists' Society Requests ASA Project To Define Reliable "Approval Systems"

A PROJECT to raise the level of reliability of "approval," "certification," and "listing" systems used in the marking of consumer goods has just been proposed by the Association of Consulting Chemists and Chemical Engineers in a request to the American Standards Association made public recently.

Such approvals, certifications, or listings by responsible agencies are of great potential value to the public and to responsible producers and distributors but, according to the Chemists' Association, this value is being dissipated by irresponsible endorsements that claim a significance they do not possess.

The National Bureau of Standards, the National Association of Purchasing Agents, the American Home Economics Association, the Consumers' Division of the U. S. Department of Labor, and the American Society for Testing Materials have told the chemists' association that they are in favor of the ASA making a study of this proposal, and would like to cooperate in it.

Cooperation Essential

The plan is to set up standard practices covering fundamentals which should underlie valid approval procedures—such standards to be developed cooperatively by consumers, producers, distributors, and advertisers, through the American Standards Association. The Chemists' Association believes that such standard practices will thoroughly justify consumer confidence and thereby help to build consumer acceptance of sound approval systems.

Among the points suggested for inclusion are:

A clear statement of the agencies backing any plan of approval;

Adequate independent sampling and testing of the product to determine its conformity with definite, published standards;

Systematic re-examination to insure continuing conformity; records of test to be publicly available; and

Compliance with these principles to be indicated on labels or tags.

In submitting their request to the American Standards Association the Association of Consulting Chemists and Chemical Engineers said:

"Consumer interests are outspoken in their desire for factual representations concerning quality of commodities and the performance of equipment offered for sale.

"Vendors in increasing numbers seek to satisfy this consumer desire but are rarely willing to afford consumer interests adequate voice in setting standards and in guiding procedures for this purpose. The more responsible among them prefer to proceed on the reputation of respected trade names and are unwilling to have recourse to deliberate misrepresentation. But the less responsible cater to the requirement for factual representation often by asserting half-truths or by implications which have no real significance. Some vendors use 'certified' as a trade designation. Such irresponsible endorsements tend to bring approval procedures into disrepute."

Asphalt Penetration Limits Changed in Proposed Revision

The standing committee in charge of Simplified Practice Recommendation R4, Asphalt, has submitted a revision of the recommendation to make certain changes in the penetration limits of asphalt to meet current needs and changes in construction practice. The Division of Simplified Practice of the National Bureau of Standards has mailed copies to all interests for consideration and approval.

The recommendation, originally effective January 1, 1924, covers penetration limits of asphalt for sheet asphalt, asphaltic concrete, construction of asphalt macadam pavement, and for surface treatment; also for joint filler, and for the preparation of joint filler for various types of construction.

Copies of the proposed revision, in mimeographed form, may be obtained without charge from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C., or from the American Standards Association.

Mining Correlating Committee Re-Elects Officers for 1936

The Annual Meeting of the Mining Standardization Correlating Committee, representative general committee heading up all work on mining standards in the American Standards Association, was held on February 19 in conjunction with sessions of the American Institute of Mining and Metallurgical Engineers.

E. A. Holbrook, dean of the College of Engineering, University of Pittsburgh, was re-elected as chairman of the committee. Lucien Eaton, Consulting Mining Engineer, Milton, Mass., and Warren R. Roberts, Roberts & Schaeffer Company, Chicago, were re-elected as vice-chairmen.

The committee discussed the possibility of further work in dust hazards, and recommended that the new National Advisory Committee, now being organized by the American Standards Association to establish threshold limits for toxic dusts, gases, and fumes, give consideration to mining problems. Because this committee is not yet organized, however, and because the program of the U. S. Bureau of Mines on this work is in process of formation, it was agreed that no revision of the American Recommended Practice for Rock Dusting of Coal Mines (M13-1925) should be undertaken at this time.

A report from the Mining and Industrial Locomotive Section of the National Electrical Manufacturers Association indicated that a third draft of standards for trolley storage battery and combination type locomotives for coal mines had been completed. It is expected that this draft will be submitted to the National Electrical Manufacturers Association for approval and publication within a couple of months. Completion of the N.E.M.A. standards is a necessary first step to activities of the sectional committee to which this project was assigned in 1930.

Grading Rules for Oak Flooring Adopted as Commercial Standard

Grading rules which have been in satisfactory use for a number of years by the National Oak Flooring Manufacturers' Association have been accepted as a commercial standard by the entire industry, according to an announcement from the National Bureau of Standards.

This forward step should facilitate the procurement of a satisfactory product manufactured to rigid nationally recognized grading specifications.

Based on this standard, it is the intention of the National Oak Flooring Manufacturers' Association to inaugurate a certification service, in which member mills will guarantee their products to meet the standard requirements. A centralized inspection service is maintained by the NOFMA and the product of accredited mills will carry a copyrighted label indicating the additional responsibility assumed by the Association.

The Commercial Standard for Oak Flooring, CS56-36, is effective for new production beginning March 15, 1936. Copies may be obtained from the Division of Trade Standards, National Bureau of Standards, Washington, D. C.

A.S.T.M. Plans New Standards Committee

The Spring Group Meetings of the American Society for Testing Materials' committees and a Symposium on High-Strength Constructional Metals were held in Pittsburgh during the week of March 2-6. Approximately 150 meetings of standing committees and subcommittees were held, and registration exceeded that of any previous meetings of this kind under the Society's direction.

The symposium, in two sessions, was given over to papers and discussions on the place of alloys of aluminum and magnesium, copper, nickel, carbon, and low-alloy steels, and corrosion-resisting steels, in construction.

Papers were presented by E. H. Dix, Jr., and J. J. Bowman of the Aluminum Company of America; C. H. Davis, American Brass Company; G. F. Geiger, International Nickel Company; E. F. Cone, editor, Metals and Alloys; and E. E. Thum, editor, Metal Progress.

The American Society for Testing Materials will organize three new committees, one on paper, a second on soap and detergents and another on soils, it was announced.

During the committee meetings revisions in many of the standards were recommended and advancement of a number of tentative standards to standard was proposed for action at the annual meeting of the Society in June.

German Standard Specifies Quality of Rubber Tubing

The German Specifications Committee has prepared standards for rubber tubing and discs used for beers, mineral waters, and fruit juices.

These must be 60 per cent pure rubber content, the rubber tubing must not crack, and the inside must be smooth and seamless. To encourage more economical production, the sizes also have been standardized.

British Arbitrate 16-mm Film Standards

Will Be Same as American Practice

F. A. Swaine, Ltd., London

Lord Riverdale hears Mr. Hoare, Western Electric Company (left) and Mr. Bruce-Wolfe, Gaumont-British Equipments (right) present opposing viewpoints on 16-mm sound film. Mr. Hoare spoke for the American type of film, and Mr. Bruce-Wolfe supported the German type.

THROUGH the courtesy of C. leMaistre, F.R.S., director of the British Standards Institution, the American Standards Association has received a copy of the press release sent to British newspapers about recent arbitration proceedings to decide on a British Standard for 16-mm sound film. The release, quoted in full, follows:

Press Notice Re Film Arbitration

Cinema Films for Educational Purposes

"For some time past the development in this country of 16 mm sound films both for amateur productions and for educational and propaganda purposes has been severely handicapped through the absence of a national agreement as to the position on the film of the sound track and also as to which side the emulsion should be.

"There have been two different standards available in this country during the past two years, differing fundamentally in that both the emulsion position and the sound track are in opposite positions so that the films are not interchangeable. If this situation had been allowed to continue both users and producers would have been severely handicapped.

"However, those directly interested in the production of the apparatus and in the making of film libraries were unanimously of the opinion that a single standard was essential but they could not reach agreement among themselves as to which standard to adopt. In a very public-spirited manner, they all agreed to accept the ruling of an independent arbitrator to be appointed by the British Standards Institution, to whom they referred the question.

"The arbitration which was recently held in the Middlesex Guildhall to determine what is to be the British Standard for this purpose is, therefore, a matter of considerable public interest.

"Lord Riverdale kindly undertook to act as the Arbitrator.

"The two rival standards correspond closely with the S.M.P.E. (American) Standard on the one hand, and the DIN (German) on the other.

"The case of those supporting the DIN Standard was presented at the arbitration by Mr. Bruce-Woolfe of the Gaumont-British Equipments, while the case on behalf of those supporting the S.M.P.E. standard was put forward by Mr. F. A. Hoare of the Western Electric Company.

"Lord Riverdale's decisions are as follows:

1. At the request of all the parties concerned I agreed to act as Arbitrator in regard to the standard which should be adopted as the British Standard.
2. Accordingly I attended at the Middlesex Guildhall on Wednesday, 26th February, to hear evidence. In addition I have carefully examined all the written material which has been furnished to me of every kind.
3. My award is that the S.M.P.E. standard shall be adopted as the British Standard.
4. Quite apart from my award and not affecting it in any way I venture to suggest that the parties might get together and endeavor to find some means of minimizing the inconvenience and possibly giving a little time for those who have been working on any other standard than the S.M.P.E. to make the change-over.

"This decision, which it must of course be remembered refers *only* to the 16 mm Sound Film, will shortly be implemented by the issue of an appropriate British Standard Specification. In the meantime the constituent parts of the British Empire have been consulted and it is anticipated that they will accept this decision, Australia having already indicated her willingness to do so.

"The decision means that throughout the English-speaking world educational films will be interchangeable.

"In regard to paragraph 4 above it was fully recognized that whichever standard was adopted it must necessarily result in some inconvenience to those who have to make the change but that the advantages of a single standard will enormously outweigh any temporary inconvenience or loss."

The standard adopted by the British Standards Institution and referred to in the press release as the S.M.P.E. standard, has been a standard of the Society of Motion Picture Engineers since 1933. It was approved as American Standard Dimensions for 16-mm Sound Film and Equipment (Z22.1-1935) by the American Standards Association in 1935.

Because of increasing use of 16-mm film for educational and industrial purposes, international agreement has become increasingly important, and American industry, therefore, last year asked the International Standards Association to initiate a project for international standardization of 16-mm sound film. This project has been organized and the secretariat is held by the German national standardizing body (Deutscher Normenausschuss).

Standard Sizes for Concrete Mixers Give Economies to Makers and Users

Standardization of concrete mixers has resulted in substantial economies to the construction industry, says the *Bulletin* of the General Contractors Association, March. It has enabled the manufacturer to give greater value per dollar invested in mixer equipment. It has enabled him to provide the contractor with a more efficient machine with which to meet exacting demands of present-day concrete practice. It has enabled the contractor to get more consistent and continuous production in line with his needs, and thus has a stabilizing and beneficial effect upon his costs. In general, it has contributed to the control of construction costs to the end that continuous investment by the public in construction projects might be encouraged.

"This movement is a splendid commentary on the results that can be anticipated from united buyer-seller action—one which other branches of the industry might well study with a view to adoption for their own, their customer's, and the industry's profit," the *Bulletin* says.

The present Concrete Mixer Standards are approved by the Associated General Contractors of America, and are subscribed to by manufacturers producing 85 per cent of the building construction mixers and 100 per cent of the paving mixers in the United States. These standards provide that only six sizes of building mixers and two sizes of paving mixers shall be manufactured within the range of approximately one cubic yard of mixed concrete capacity. Records of the Concrete Mixer Manufacturing Industry of the United States, before 1924, indicate that within the range of approximately one cubic yard of mixed concrete capacity, there were being manufactured and offered for sale at least 13 various-sized building construction mixers, 2½S, 3-S, 4-S, 5-S, 6-S, 7-S, 8-S, 10-S, 11-S, 14-S, 21-S, 28-S, 30-S.

Simplified Practice Recommendation For Metal Lath To Be Revised

The Standing Committee in charge of Simplified Practice Recommendation R3-28, Metal Lath, has approved revising this recommendation by eliminating certain varieties of metal lath galvanized after fabrication and by adding further weights and varieties of the ¾-inch rib-expanded lath. The Division of Simplified Practice of the National Bureau of Standards has been requested to refer these changes to acceptors and others interested, for consideration and approval.

The recommendation, first promulgated in 1924, established a simplified schedule of stock sizes and varieties of metal lath of the flat-expanded, ⅜-inch rib-expanded, and flat rib-expanded types.

Copies of the proposed revision, in mimeographed form, may be obtained gratis from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Canadian Standards Association Adds Sections to Electrical Code

Two new sections of the Canadian Electrical Code have been completed and approved by the Canadian Engineering Standards Association, on construction of auxiliary gutters, junction-boxes and pull boxes, and on construction and test of automatic motor-control devices of small capacity.

The purpose of these specifications is to outline conditions which must be met to secure laboratory approval for the sale, or other disposal, and use, of electrical equipment in Canada.

Building Code Correlating Committee Recommends Six New Building Projects

Six additional subdivisions, on fundamental problems in building code work, were recommended by the Building Code Correlating Committee of the American Standards Association at its meeting March 13. The work of the subdivisions recommended will cover building code requirements for:

Masonry
Iron and steel
Wood
Re-enforced concrete
Excavations and foundations
Working stresses

The committee recommended that the ASA Standards Council, final authority on all standards approved by the American Standards Association, authorize the development of these projects by sectional committees of the ASA. The recommendation is subject to confirmation by letter-ballot of the entire membership of the committee.

The Building Code Correlating Committee has already recommended that the Standards Council authorize committees on administration, fire protection and fire resistance, chimneys and heating appliances, light and ventilation, and fire extinguishing equipment.

Rules Guide Committee

A preliminary draft of instructions, to guide the sectional committees which will work on phases of the building code program, was considered by the Correlating Committee. Such instructions, the committee agreed, should not limit these committees in the technical details of their work but should cover matters on which coordination with the work of other sectional committees in the building code program is essential.

A subcommittee report on possible revision of the U. S. Department of Commerce report on Recommended Practice for Arrangement of Building Codes—BH8—was considered and referred back to the subcommittee for further study.

A document to be circulated by the American Municipal Association to its 5,000 member towns and cities throughout the country, announcing the formation of the Building Code Correlating Committee, its relation to the former Building Code Committee of the U. S. Department of Commerce and to the continuing program of the National Bureau of Standards on building codes, was considered and approved by the correlating committee.

The committee agreed with recommendations of its executive committee that the American Institute of Architects should be invited to designate an additional representative.

The International Association of Governmental Labor Officials recently named Herman B. Byer as its representative on the Building Code Correlating Committee, it was announced.

Of the organizations originally approved by the American Standards Association for membership in the committee, the National Association of Building Owners and Managers is now the only group which has not yet appointed its representative.

A.S.T.M. Reports Increase Of 62 Standards in 1935

Some indication of 1935 activity in the field of standardizing specification requirements and methods of testing materials can be gained by comparing the number of American Society for Testing Materials' standards and tentative standards at the close of 1935, namely 794, with the total at the end of 1934, 732—an increase of 62. Of the specifications and tests now sponsored by the Society, 504 have been adopted as official standards, while 290 have been issued as tentative standards. Much of the committees' standardization work during 1935 was concerned with development of requirements for a large number of materials and subjects not previously covered in the standardization work.—*A.S.T.M. Bulletin, January, 1936.*

ASA Issues Addition to Pipe Flange Standard

A new section giving ratings for steel flanged fittings and companion flanges at temperatures below 750 F has been approved as an Addendum to the American Standard Steel Flanged Fittings and Companion Flanges (B16e-1932). Because this American Standard is now incomplete without the Addendum, ASA members who have copies of the standard in their files, are invited to write for the Addendum. These copies are free of charge.

International Meetings, Scheduled For September, Will Discuss Standards

by

John Gaillard

Mechanical Engineer, American Standards Association

Recommendations That May Affect American Export Requirements Will Be Considered; ASA Presents Views of American Industry

THE International Standards Association, with which the American Standards Association is affiliated, and whose recommendations may have a far-reaching effect on American products competing in the world markets, is planning to hold a series of meetings, scheduled tentatively for a two-weeks' period beginning September 14, at Budapest.

Fourteen of the 38 projects so far undertaken by ISA technical committees are on the program for discussion.

On account of the particular interest of American groups in a number of ISA projects, the American Standards Association is represented on ten of the 38 technical committees of the ISA, and is in charge of the secretariat of one of these.

ISA Promotes International Uniformity.—The main object of the International Standards Association (ISA) is to promote uniformity among the standards developed by the various national standardizing bodies, through their voluntary cooperation.

In April, 1926, delegates from 18 national standardizing bodies held a conference in the Engineering Societies Building in New York, and laid the foundation for the ISA. This organization is now a federation of 19 national bodies, each of which acts as the clearing house for standardization work in its own country. These 19 countries are listed in the next column.

The national standardizing body in Greece has just decided to become a member of the ISA, which will raise the ISA membership to 20.

The American Standards Association formally became a member of the International Standards Association in 1929, and C. E. Skinner, past-president of the ASA, was a member of the ISA Council for three years beginning January 1, 1931.

In connection with the work proposed for the Budapest meetings, the set-up and present activities of the ISA are briefly reviewed below:

Organization of the ISA.—The administrative guidance of the International Standards Association is in the hands of a Council consisting of a president and six members. The president is elected by the national standardizing bodies affiliated with the ISA. The Council members each represent one of six national standardizing bodies selected by letter-ballot from the entire ISA membership.

The "Plenary Assembly," a general conference of delegates from all of the national standardizing bodies which are members of the ISA, meets as a rule every three years. This body is the final authority in ISA matters.

The president of the Council is Nils Frederiks-

ISA Members

Austria	Germany	Poland
Belgium	Holland	Roumania
Czechoslovakia	Hungary	Spain
Denmark	Italy	Sweden
Finland	Japan	Switzerland
France	Norway	United States
	USSR	

son, president of the national standardizing body in Sweden. For the year 1936, the Council is composed of representatives of Hungary, Norway, Japan, Roumania, France, and Germany, the two latter countries having been proposed to fill the vacancies that occurred at the end of 1935.

ISA Technical Committees. — The project work of the ISA is done by technical committees. These are organized by authority of the Council, upon request from one of the national standardizing bodies affiliated with the ISA, provided such a proposal gets sufficient support from the other ISA members. Each country has the right to be represented on every technical committee. Findings of the committees are laid down in a final report which serves as a recommendation to all members for use in establishing their own national standards. Acceptance of the recommendations is entirely voluntary.

Most of the following 38 committees which have been approved, to date, by the ISA Council, have done a considerable amount of work and some have completed a final report. (See next column):

ISA Technical Committee

1. Screw threads; bolts and nuts (inch system)
2. Screw threads; bolts and nuts (metric system)
3. Fits between cylindrical parts
4. Ball and roller bearings
5. Pipe and pipe fittings
6. Paper sizes
7. Rivets
8. Ships' elements
9. Conversion tables
10. Drawings
11. Test pressures and materials for stationary boilers
12. Soil pipe
13. Center heights of shafts
14. Shaft extensions
15. Shaft couplings
16. Shafting keys
17. Steel and iron
18. Commercial zinc
19. Standard diameters
20. Aeronautics
21. Sprinkler systems
22. Automobiles
23. Agricultural machinery
24. Sieves
25. Cast iron and cast steel
26. Bronze and brass
27. Coal
28. Petroleum products
29. Tools
30. Flow measurement
31. Tires, rims, and tire valves
32. Preferred numbers
33. Refractory materials
34. Agricultural products
35. Pigments
36. Photography and cinematography
37. International terminologic code (not yet organized)
39. Machine tools (not yet organized)

Projects on Textiles (ISA 38) and Upholstery Hair (ISA 40) are under consideration.

Fourteen ISA Committees Schedule Fall Meetings

Fourteen ISA technical committees are planning to meet in Budapest, probably in September. The subjects to be discussed by these committees are:

Aeronautics
Agricultural machinery
Automobiles
Drawings
International terminologic code
Photography and Cinematography
Pigments (Raw materials for the manufacture of paints)
Pipe lines
Preferred numbers
Refractory materials
Screw thread tolerances
Steel and iron
Tools
Wood screws

On four of these committees the American Standards Association is represented. They are: Steel and iron, Preferred numbers, Refractory materials, and Photography and cinematography.

ISA Recommendations:—Final reports on the recommendations of ISA technical committee have been completed on the following subjects:

Title	*Project*	*ISA Bulletin No.*
Ball Journal Bearings	ISA 4	1
Axle Heights for Machines	ISA 13	2
Shaft Ends for Machines and Apparatus	ISA 14	3
Keys	ISA 16	4
Rigid Couplings	ISA 15	5
Conversion Tables, Inches-Millimeters	ISA 9	6
Paper Sizes	ISA 6	7
Thrust Ball Bearings	ISA 4	8

American Participation in ISA Work.—In accordance with the expressed wish of the American groups concerned, the American Standards Association is represented on the ISA technical committees listed below. Several of the American experts listed under the committees in which they are interested have attended meetings of ISA technical committees in Europe.

Ball and Roller Bearings—ISA 4
Ernest Wooler, Chief Engineer, Timken Roller Bearing Company, Canton, Ohio

Steel and Iron—ISA 17
F. N. Speller, Metallurgical Engineer, Department of Metallurgy and Research, National Tube Company, Pittsburgh, Pa.

Sieves—ISA 24
Dr. L. V. Judson, Division of Weights and

American Industry Cooperates Through ASA on ISA Projects

American industry has a particular interest in the work of nine ISA technical committees, and the American Standards Association is, therefore, represented on these committees. They are:

Ball and Roller Bearings
Steel and Iron
Sieves
Coal (Methods of Sampling and Analysis, and Size Grading)
Nomenclature and Methods of Test of Petroleum Products
Flow Measurement by Means of Nozzles and Diaphragms
Tires, Rims, and Tire Valves
Preferred Numbers
Refractory Materials
Photography and Cinematography

Other ISA projects on the development of which the American Standards Association keeps its Members informed are: Fits Between Cylindrical Parts; Rivets; Conversion Tables; Drawings; Aeronautics; Automobiles; Coal; and Tools.

Measures, National Bureau of Standards, Washington, D. C.; Secretary, ASA sectional committee Z23 on Sieves

Coal (Methods of Sampling and Analysis, and Size Grading)—ISA 27
A. C. Fieldner, U. S. Bureau of Mines, Washington, D. C.; Chairman, ASA Sectional Committee M20 on Classification of Coals

Nomenclature and Methods of Test of Petroleum Products—ISA 28
Dr. R. P. Anderson, Secretary, Division of Refining, American Petroleum Institute; Secretary, ASA Sectional Committee on Methods of Testing Petroleum Products and Lubricants (Z11)

The ASA is in charge of the secretariat of this ISA Committee

Flow Measurement by Means of Nozzles and Diaphragms—ISA 30
W. A. Carter, Technical Engineer of Power Plants, Detroit Edison Company, Detroit, Mich.

Tires, Rims, and Tire Valves—ISA 31
K. D. Smith, The B. F. Goodrich Company, Akron, Ohio. *Alternate*: R. T. Brown, Tire Design Division, The Goodyear Tire and Rubber Company, Akron, Ohio

Preferred Numbers—ISA 32
R. E. Hellmund, Chief Engineer, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.; Chairman, ASA Sectional Committee Z17 on Preferred Numbers

Refractory Materials—ISA 33
S. M. Phelps, Director of Research and Tests, Mellon Institute of Industrial Research, Pittsburgh, Pa. *Alternate*: R. S. Bradley, Director of Research, A. P. Green Fire Brick Company, Mexico, Missouri

Photography and Cinematography—ISA 36
George Friedl, Jr., Electrical Research Products, Inc., New York, N. Y.

ASA Member-Bodies, Associate Members, or sectional committees, are also interested in other ISA projects and the ASA is, therefore, keeping them informed regularly about ISA developments in these fields. Among these may be mentioned: Fits Between Cylindrical Parts; Rivets; Conversion Tables; Drawings; Aeronautics; Automobiles; Coal; and Tools.

Proposed New ISA Projects.—Requests for the organization of new ISA committees to deal with Textiles and Upholstery Hair have been circulated among the ISA members. A decision on these cases is still pending.

The American Standards Association has referred the question whether American industry will take part in the work of the new ISA committee on Machine Tools to its Mechanical Standards Committee and to ASA committee B5 on Small Tools and Machine Tool Elements, for advice. The proposal regarding Upholstery Hair has been referred to the National Association of Curled Hair Manufacturers, which still has it under consideration.

The proposal regarding Textiles will be submitted to the American groups for advice soon, as will also the question whether American participation is desired in the new project, International Terminologic Code.

Attendance Budapest Meetings.—If any Member-Body or Associate Member of the American Standards Association wishes a representative to attend the meeting of an ISA committee in

ISA Meetings Are Open To American Experts

Any Member of the American Standards Association who wants a representative to attend the International Standards Association meetings in Budapest is invited to get in touch with the ASA office.

Through its affiliation with the ISA the American Standards Association will be able to make all necessary arrangements for attendance of Members' representatives at any of the ISA meetings.

As soon as the date of the meetings has been finally decided, announcement of the decision will be published in *Industrial Standardization*.

Budapest, the ASA will be glad to make the necessary arrangements. This also applies to Company Members who may want a European representative, or an expert who may happen to be in Europe at the time of the meetings, to attend.

Please note that the final date of the meetings is still to be announced.

British Steel Standard Provides Fifty Per Cent Higher Tension

Steel of high tensile strength is recognized as suitable for general construction in Great Britain, for the first time, in the British Standard Specification for the Use of Structural Steel in Building, just revised.

During recent years, steel of a higher tensile strength than the traditional mild steel has been used in a number of important structures, such as the Sydney Harbor Bridge, in which silicon steel was used for the greater part of the steel work in the arch span. The satisfactory results obtained from the use of this steel, and the fact that suitable high-tensile steels can now be obtained from different makers, have made it possible to adopt a steel of 50 per cent higher tensile strength than the mild steel which has been accepted during the past 40 years as the standard material for general structural work in Great Britain, says *Engineering*, London, March 6.

Other points of interest in the new specification are the revised method of determining the thicknesses of slab bases and the permissive use of black bolts for secondary connections, in addition to the adoption of high-tensile steel.

The revised specification is based on recommendations resulting from research carried on by the Steel Structures Research Committee of the Department of Scientific and Industrial Research. The quality of the high-tensile steel recommended in this revised specification is defined in a recent British Standard Specification, No. 548.

Taper Roller Bearings Recommendation Revised

Simplified Practice Recommendation R67-33, Taper Roller Bearings, has been revised and will be issued in printed form in a new edition with the index number R67-36, according to an announcement of the Division of Simplified Practice, National Bureau of Standards. Reprinting has been made necessary by the unusual demand for this recommendation and advantage was taken of the opportunity to change the dimensions of one bearing in the medium series to make it conform with the new dimensions adopted by the Society of Automotive Engineers, in 1935. The revised recommendation is effective from January 1, 1936.

The recommendation, originally approved at a joint conference of the industry in February, 1927, established a simplified list of sizes and varieties of taper roller bearings. The Society of Automotive Engineers cooperated with the Division of Simplified Practice in arranging for the preliminary conference and prepared a list of bearing sizes which served as the basis for the first edition.

A revision of the recommendation in 1933 brought the schedule into accord with the revised standards adopted by the Society of Automotive Engineers in January, 1932, and extended the medium series to 11-inch bore and the heavy series to 12-inch bore. It also included a table for steep angle taper roller bearings, ranging in size from 0.750-inch to 12-inch bore, intended for naval and general industrial use.

Copies of the proposed revision, in mimeographed form, may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

British Standards Help Suppress Radio Interference

A specification for the rating, performance and testing of condensers, inductors, and resistors used in the construction of devices to suppress radio interference was approved recently by the British Standards Institution. An Appendix gives numerous diagrams of connections and schedules of component values, which have been found satisfactory in practice for the suppression of interference from various types of machines and appliances.

The British Standards Institution intends to follow this specification with a general specification on the permissible limits of radio interference and methods of measurement of interference.

The standard, B.S.I. No. 613-1935, may be borrowed or purchased through the ASA office.

Propose Standard Tests for Refrigerating Equipment

Co-operation between the air-conditioning and refrigerating manufacturers' associations through the American Society of Refrigerating Engineers has resulted in proposed standard methods of rating and testing equipment, made available recently.

Four methods of testing and rating mechanical condensing units are proposed as optional in the refrigerating equipment report.

Conlin

Alfred W. Devine

ASA Approval of Automobile Is New Milestone in Public

Labeling Provision Protects Motoring Public; Gives Practical Check on Use of American Standard Specifications for Safety Glass

by

Alfred W. Devine

Registry of Motor Vehicles, the Commonwealth of Massachusetts,

and

Chairman, Sectional Committee on Safety Code for Specifications and Methods of Test for Safety Glass

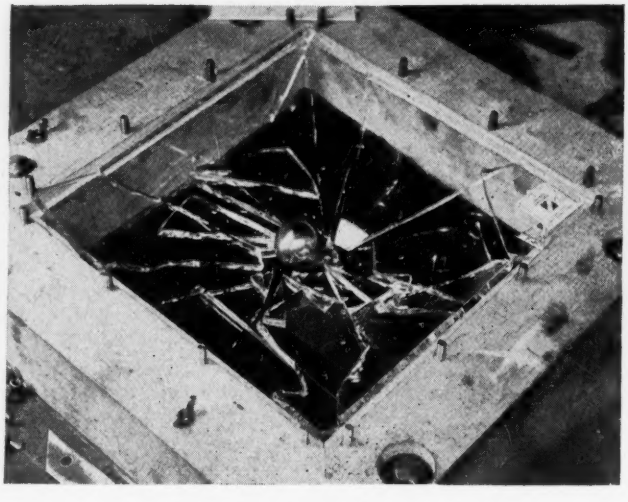
THE American Standards Association has made another important contribution to public safety with the approval of Specifications and Methods of Tests for Safety Glass for Motor Vehicles Operating on Land Highways.

Glass, at normal temperatures, is a hard, brittle, amorphous substance and breaks into sharp, irregular shapes when fractured. These characteristics are not considered seriously objectionable in many ordinary uses of the material. However, when glass is used for glazing the windshields, windows, or partitions of motor vehicles, there exists great danger of breakage due to the extreme hazards of use. Furthermore, the collision of a moving motor vehicle with any other object usually results in the projection of sharp and jagged pieces of glass into the interior of the motor vehicle, often with serious results to the occupants.

Efforts have been made, over the past several years, to reduce this hazard by holding the glass together when broken, or by processing it so as to change the form of the fragments. The former has been accomplished to a considerable extent by laminating two pieces of glass with a plastic layer between and by embedding wire in the glass. The latter has been accomplished by heat-treating the glass so as to give it very much greater strength and cause it to granulate when fractured.

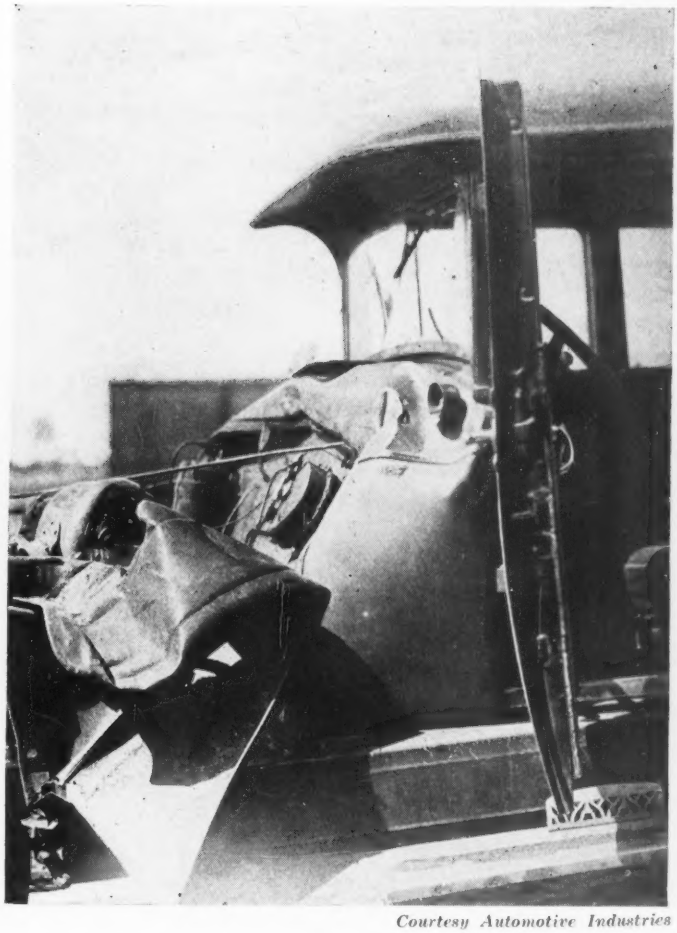
Recognition has been given to the safety characteristics of laminated, heat-treated, and wired glass and many states by law now require the use of safety glass in motor vehicles. Many other states are following this lead, but the specifica-

Regular Glass Breaks into Sharp, Jagged Pieces When Ball is Dropped on It During Test



Glass Code Safety Work

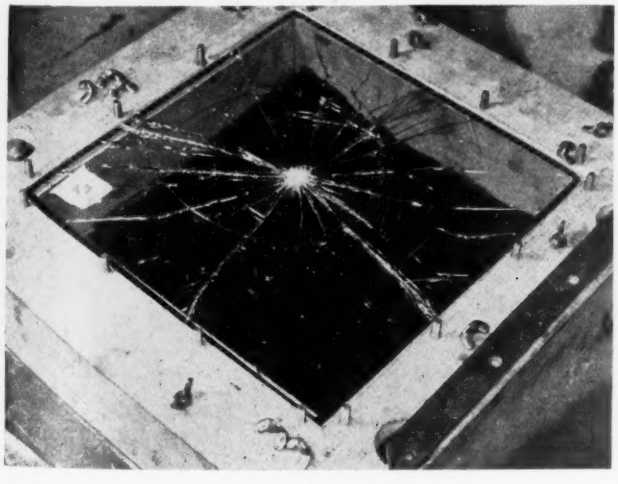
tions for acceptability of safety glass in the various states have not been uniform throughout the country. With motor-vehicle travel as extensive as it is in this country it is manifestly of extreme importance to have the requirements in all states substantially the same so that the operators of vehicles travelling from one state to another may not be molested by enforcement officers. For the sake of the industry too it is necessary that a uniform standard be adopted so that manufacturers may furnish one kind of product for the whole country. The necessity for uniformity brought a request from the National Bureau of Casualty and Surety Underwriters for a national standard on safety glass. The National Bureau of Standards joined with the Underwriters in sponsoring this work.



Courtesy Automotive Industries

When the Ball Is Dropped on Safety Glass, the Glass Cracks But Holds Together

Courtesy Electrical Testing Labs.



A sectional committee of the American Standards Association was then formed and, as in all American Standards work, representatives of every interested group were invited to participate. The list of representatives, with the groups which they represented, clearly indicates the broad representation which was effected. (See page 96).

State Laws Await Standard

It has been gratifying to the members of our committee to know that practically every state in the Union has been watching our work with interest. Many states have delayed passing legislation or regulations requiring the use of safety glass in motor vehicles until our committee had prepared these standards, which they expect to use as the basis of their requirements. Uniformity of regulations is of the utmost importance, and the American Standards Association has made a valuable contribution in the interest of the motorist by bringing about national agreement on safety glass standards.

The safety glass standard, which is now published, is believed by the committee to represent the best possible standard which may be formulated at this time on safety glass for use in motor vehicles operated on land highways. The development of safety glass has not ceased, and it is to be expected that further improvement in the quality of the safety glass produced will form the basis for revision of the standard from time to time as such revision appears to be advisable and justifiable—a regular practice of the American Standards Association. It is manifestly useless and impractical to adopt a standard which industry may not reach. The committee believes that safety equipment alone cannot be expected to prevent accidents, but that by improving safety equipment the accident hazard on highways and streets in this country will be reduced.

The Code adopted by the sectional committee was first prepared in all essential detail by a smaller subcommittee of eleven members. The subcommittee had available the work of independent experts. This included the test work of a large automobile manufacturer and the invaluable experience and data furnished by glass and plastic manufacturers. In particular, the National Bureau of Standards, because of its fine research work in the field of glass in the public interest, had a leading part in the work. We feel sure, therefore, that the standard approved by the American Standards Association represents the best that it is now possible to obtain.

"American Standard" Label Protects Automobile Rider

When he sees the label "American Standard" stamped on the glass of the windows and windshield of his car an automobile owner can be sure that his chance of injury has been reduced through the use of safety glass which meets the American Standard minimum requirements.

The Safety Glass Association has assumed the responsibility for policing the use of the label "American Standard" on safety glass. It will see that each type of safety glass is tested by an independent laboratory of recognized standing. It will investigate complaints, and arrange for the necessary laboratory tests in checking complaints. It will require that each company using the label agree to notify it of any change in process of manufacture, and arrange for retests to re-qualify the glass for the use of the label. It will subject all brands of glass which carry the label to routine check tests on samples purchased by the laboratory in the open market to insure continuing compliance.

This use and policing of the label does not apply to glass purchased from dealers for replacement after the car has been bought from the manufacturer.

Subcommittee Prepared Safety Glass Standard

A representative subcommittee was appointed by the Sectional Committee on Safety Code for Specifications and Methods of Test for Safety Glass to do the preliminary work on the code and submit recommendations for a standard to the sectional committee. The members of the subcommittee which prepared the safety glass standard for consideration by the sectional committee were:

William F. Little, Electrical Testing Laboratories, *Chairman*
A. F. Odell, duPont Viscoloid Company
E. A. Wilson, Fiberloid Corporation
R. A. Miller, Pittsburgh Plate Glass Company
C. W. McCusker, Saftee Glass Company
Martin Schrieber, Public Service Coordinated Transport
H. C. Mougey, General Motors Corporation
George L. McCain, Chrysler Corporation
Burton W. Marsh, American Automobile Association
Alfred Devine, Registry of Motor Vehicles, Massachusetts
A. N. Finn, Chief, Glass Division, National Bureau of Standards
Maxwell Halsey, National Bureau of Casualty and Surety Underwriters
E. H. Hobbie, Mississippi Glass Company

Australian Standard Outlines Uniform Code for Road Signs

A standard code for road signs was published recently by the Standards Association of Australia in order to facilitate the use of uniform road signs throughout the Commonwealth. The code deals with direction signs, information signs, and warning signs, but traffic instruction signs will probably be covered in a separate code.

ASA Safety Glass Committee Represents Many Interests

Many organizations interested in the problem of safety glass standards, from the differing points of view of glass manufacturers, automobile manufacturers, state regulatory bodies, insurance interests, automobile drivers, and technical experts, were represented on the Sectional Committee which recommended the Safety Code for Specifications and Methods of Test for Safety Glass to the American Standards Association for approval.

The National Bureau of Casualty Underwriters and the U. S. Department of Commerce—National Bureau of Standards took the leadership in the work on the safety glass standard.

The members of the sectional committee are:

Alfred Devine, Eastern Conference of Motor Vehicle Administrators, *Chairman*
A. N. Finn, U. S. Department of Commerce, National Bureau of Standards, *Vice-Chairman*
W. M. Graff, National Bureau of Casualty and Surety Underwriters, *Secretary*
Aeronautical Chamber of Commerce of America, Inc., *Reed M. Chamber, Ralph Damon (alt.)*
American Automobile Association, *Burton W. Marsh*
American Ceramic Society—Glass Division, *Dr. J. T. Littleton, Donald Sharp (alt.)*
Association of American Railroads—Engineering Division, *J. B. Young*
American Society for Testing Materials, *H. C. Mougey, R. E. Hess (alt.)*
American Society of Mechanical Engineers, *Thomas A. Walsh, Jr.*
American Transit Association, *W. J. Cumming, Ewen J. Fraser (alt.)*
Cellulose Plastics Manufacturers' Association, *Dr. A. F. Odell, E. A. Wilson, A. F. Caprio (alt.), George H. Murray (alt.)*
Eastern Conference of Motor Vehicle Administrators, *Alfred Devine, Michael A. Conner (alt.)*
Electrical Testing Laboratories, *W. F. Little, Gordon Thompson (alt.)*
Harvard University—Bureau for Street Traffic Research, *Maxwell Halsey*
National Association of Engine & Boat Manufacturers, *Alfred E. Luders*
National Association of Motor Bus Operators, *Martin Schreiber, George S. Engle (alt.)*
National Association of Mutual Casualty Companies, *E. A. Dearborn, S. E. Whiting*
National Bureau of Casualty and Surety Underwriters, *Harold F. Hammond, Holger Jensen, J. L. Keene (alt.)*
National Safety Council, *S. J. Williams, O. W. Wilson (alt.)*
National Safety Council, Accident Prevention Equipment Manufacturers Section, *Edwin L. Hettinger, Walter King (alt.)*
National Society for the Prevention of Blindness, *Lewis H. Carris, Louis Resnick (alt.)*
Optical Society of America, *E. D. Tillyer, Henry F. Kurtz (alt.)*
Safety Glass Association, *Dr. F. L. Bishop, E. H. Hobbie, C. W. McCusker, R. A. Miller, Dr. Geo. B. Watkins, Wilbur W. White (alt.)*
Society of Automotive Engineers, *W. H. Graves, H. B. Haskins, George McCain, H. C. Mougey, Robert S. Burnett (alt.)*
Underwriters' Laboratories, Inc., *Geo. D. Becker, C. W. Rulon (alt.)*
U. S. Department of Commerce—National Bureau of Standards, *A. N. Finn, P. H. Bates (alt.)*
U. S. Navy Department, *Commander R. F. Frellson*

Safety Glass Committee Plans More Standards

The general public is well acquainted with the dangers of flying glass in automobile collisions, but there are other less familiar uses of glass which may be equally dangerous.

The Sectional Committee on Specifications and Methods of Test for Safety Glass is authorized to prepare standards for some of these other uses.

Specifications for safety glass used in motor boats, aircraft, goggles, and in bullet-proof windows and partitions will be considered by the committee now that the automobile glass standards are completed.

Sears Roebuck Catalog Defines "Buy-Words"

Definitions, tests, and laboratory specifications for merchandise which is described as "all wool," "fadeproof," "fast color," "pre-shrunk," "rustproof," "washable," etc., are included in the Sears Roebuck & Company's new spring catalog.

A list of "buy-words"—definitions of terms and trade names which appear through the book, as for example, "full fashioned," "mercerized cotton,"—is given.

The feature is intended to give the consumer information which will help her to judge quality and value, according to the Sears Roebuck Company's announcement.

Policy on Labeling Set by ASA Board of Directors

A general policy has been set down as a guide for all labeling programs for American Standards, in a resolution adopted by the Board of Directors of the American Standards Association. This policy provides:

"1. Any program of certification, labeling, or grade marking, in order to be adequate, should be based upon specifications which are publicly available and nationally recognized.

"2. It is for the group or groups substantially concerned with the specifications to decide whether there is to be certification or labeling; and the ASA itself cannot directly take any primary responsibility in respect to such activities.

"3. Any certification or labeling program should be effectively supervised by a properly qualified body; e.g., a trade association, or a testing laboratory, operating under proper administrative management."

ASA Approves A.S.T.M. Standard Test Methods for Coal and Coke

Test methods for coal and coke developed by American Society for Testing Materials' Committee D-5 have been approved by the American Standards Association as American Standards. They are:

Test for Cubic Foot Weight of Crushed Bituminous Coal (K20.1-1936)
Test for Cubic Foot Weight of Coke (K20.2-1936)
Tumbler Test for Coke (K20.3-1936)
Shatter Test for Coke (K20.4-1936)
Test for Volume of Cell Space of Lump Coke (K20.5-1936)

These standards supplement Methods of Laboratory Sampling and Analysis of Coal and Coke (K18-1933; A.S.T.M. D 271-33) and Method of Sampling Coal (XI-1921; A.S.T.M. D21-16).

Standardization of the tests recently approved by the ASA was begun by the American Society for Testing Materials' committee before 1922, when the tentative methods for the shatter test were first published by the Society. A year later a tentative test method for volume of cell space of lump coke was published.

Work on the development of a standard method for the tumbler test was initiated in 1926 and a tentative method was first published two years later. A proposed method for determining cubic foot weight of crushed bituminous coal, and the bituminous weight of coke was published as information in 1927. In due course revisions of all of these tests were adopted as standard by the Society.

All of the tests for coke are widely used by manufacturers and consumers of coke, particularly metallurgical coke, although some of the tests have equal application to the testing of domestic coke. The method of test for cubic foot weight of crushed bituminous coal is used at by-product coke plants in the preparation of charges for the coke ovens. This test was designed for this particular purpose so its use is limited to the by-product of the coke industry.

Copies are available from the American Standards Association or from the American Society for Testing Materials at 25 cents.

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Standards Set for Elastic Fabrics for Use in Overalls

A Commercial Standard for Woven Elastic Fabrics for Use in Overalls (Overall Elastic Webbing) (CS 58-36) has just been announced by the National Bureau of Standards. This standard establishes definitions, general requirements, and methods of testing of woven elastic fabrics for use in overalls.

Copies are now available in mimeographed form without charge, from the American Standards Association or from the Division of Trade Standards, National Bureau of Standards, Washington, D. C.

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Tire and Rim Association Issues New Tire Standards

New standards for tires of all types, prepared by the Tire and Rim Association, have been made available by the Association in a new Year Book, just published.

Service loads and inflation tables for different sizes and types of tires, recommended rims to use with each tire, standard rim contours, gages, and valves are given for passenger cars, trucks and busses, motorcycles, airplanes, agricultural equipment, and solid and cushion tires.

The book may be obtained from the Tire and Rim Association, 1401 Guarantee Title Building, Cleveland, at $2.00 a copy.

Uniform State Regulations Is Aim Of Division of Labor Standards

by

V. A. Zimmer

Director, Division of Labor Standards
U. S. Department of Labor

Division Works on Promotion of Labor Standards, Safety and Health, and Exhibits

American Standards Association and Division Cooperate on Safety Standards

As a result of repeated requests of state labor officials and representatives of other agencies interested in labor law administration, the Division of Labor Standards was established by Secretary Perkins in the U. S. Department of Labor, in November, 1934.

The division was initiated to serve as a rallying point for the efforts of interested persons and organizations, state departments of labor, and Federal government departments whose common object is to improve the working and living conditions of wage earners and their families and to establish adequate health and safety standards in industry. It fills a long recognized want in supplying an official clearing house for information on labor law administration and procedure.

The Division organization comprises a Director, an Assistant Director, and four sections or units; namely, Promotion of Labor Standards; Safety and Health; Exhibits; and General Administration.

Promotion of Labor Standards

The unit for the promotion of labor standards is charged with the study and dissemination of information on state labor laws, advocacy of improved working standards, the preparation, in cooperation with state officials, of draft labor bills, and generally with helping to bring the laws of various states into such harmony as is feasible because of similar economic conditions.

The desirability of greater uniformity in state labor laws is generally recognized, but efforts to secure such uniformity and adoption of better working conditions and standards for safety, health, and improved inspection require, first of all, research into existing conditions in the states. This is being carried on. The data thus obtained is regularly compiled and furnished to the states.

The Division is now undertaking a study of labor laws and administrative procedure in a number of important states for the purpose of compiling an inspectors' manual based on the best practices in the enforcement of labor laws. In several states there are now commissions for the study and promotion of uniform labor standards, but labor law administration, of equal importance with statute enactment, has not on the whole been given sufficient emphasis. On the basis of the study now being conducted it is hoped to draft rules of model procedure as a guide to state administrations.

The enlistment of the efforts of organized labor groups for worker education and to obtain concerted action toward the adoption of improved labor legislation is also one of the more important elements of this program.

One of the principal services which the Division extends, upon request, to state labor departments, industrial commissions, state federations of labor, and other organizations having legitimate interests in labor problems is the drafting of various types of labor legislation. These drafts are of two types:

(1) Model, or standard drafts, designed to serve as a basis for various types of labor legislation, based upon the experience of those states which have dealt with the instant problems;

(2) Labor laws designed to fit the individual needs of a particular state, or of a group of states having similar economic and social patterns.

Requests for assistance in drafting both types of legislation have been unusually heavy in the last year.

The Second National Conference on Labor Legislation recommended that the U. S. Department of Labor be asked to investigate the extent and nature of the passage of homework goods in interstate commerce, and the possibilities of State and Federal legislation to control this practice. Following the conference the Secretary of Labor appointed a homework committee composed of state labor law administrators and representatives of the Department of Labor, of which a member of the staff of the Division of Labor Standards serves as secretary.

Homework Section Gets Reports

As an outgrowth of the committee's suggestion the Division has established a medium of homework reporting. This system, with which a number of states have cooperated, includes interstate reporting and reporting by the states to the U. S. Department of Labor.

A continuing homework committee has been appointed by the Secretary to draft legislation applying to industrial homework, both State and Federal. In cooperation with other bureaus of the Department of Labor, this Division has made studies of the provisions of existing labor laws and on this basis the committee has prepared tentative drafts for a standard homework bill. The Division has cooperated in a similar capacity with state committees composed of Labor Commissions from Arkansas, Ohio, Wisconsin, Oklahoma, and Connecticut, on wage payment and wage collections, and with other state committees interested in minimum wage.

Bulletin Service Started

A bulletin service has been inaugurated by the Division, which has for its purpose the current dissemination of information on labor law administration. The first issue of the bulletin, just published, deals with such matters as State labor legislation during the past six months, and contains brief reference to the New York minimum wage law decision, and the U. S. Supreme Court decision on the Federal Hawes-Cooper Act, the extension of industrial hygiene activities by State governments, training courses for factory inspectors inaugurated by the Division of Labor Standards, and an outline of the program for silicosis control projected by the Department of Labor, as well as comments on Department publications and conference proceedings of interest to State departments of labor.

Safety and Health Unit

The technical staff of the safety and health unit is made up of a chief safety engineer, a senior safety engineer, an assistant safety engineer, one medical adviser in industrial hygiene, and two industrial hygienists.

The organization of this unit centers around two main objectives: The reduction or prevention of industrial accidents and the control and elimination of occupational hazards.

In this work the Division primarily serves the individual state labor departments and industrial commissions. It necessarily works very closely with national and local organizations of many different types interested in preventive work in these fields, such as the American Standards Association, the National Safety Council, the American Federation of Labor, the United States Public Health Service, the National Bureau of Casualty and Surety Underwriters, the Bureau of Mines, the International Association of Industrial Accident Boards and Commissions, and many business associations which have definite safety divisions, or are actively interested in accident prevention programs.

As a means of improving standards in the fields of accident prevention and reduction of occupational disease hazards, the Division has undertaken a number of studies in the past year, with particular emphasis on variations in state programs. Information was secured from 44 state administrative agencies covering methods of administration and types of problems encountered. In many cases this information was obtained directly by the Department from representatives in the field. A number of comparative analyses of the data thus obtained are being made and the results furnished to the states.

The effectiveness of accident prevention and occupational disease prevention programs depends in large measure on the intelligent cooperation of the worker. One of the most important elements of the safety work of the Division is the continuous contact with the employee organizations and, where possible, with the individual employee in definite worker-education programs.

Continuous efforts are made to compile general information on a wide range of health and safety standards designed to reach every legitimate type of interest, because material of this sort is not usually easily accessible. To date, nine pamphlets on industrial health, written in language easily understood by the ordinary employee, have been disseminated. These cover

some of the major industrial hazards, such as industrial skin diseases, silicosis, anthraco-silicosis, arsenic, carbon monoxide, chromium, mercury, lead, and benzol poisoning.

Of a more technical nature, and in general designed for the use of state administrative agencies, business groups, and technicians are other publications, such as *Discussion of Industrial Accidents and Diseases*, and *Some Rules for Safeguarding of Hazardous Machinery*, *Manual of Information on Safeguarding of Hazardous Machinery and Guides*, *Some Important Features of Occupational Disease Legislation*. There are also descriptive charts on occupational disease coverage in the compensation acts of the United States and occupational disease coverage in the compensation acts of the United States, Canada, and England.

The Division, at the request of the Secretary of Labor, has been active in promoting accident prevention programs in the Government service. It has been particularly active in organizing a permanent inter-department safety council. A steering committee, on which the Division is actively represented, has been appointed, and the Division, because of the nature of its work, will have to play a leading part.

Cooperate With ASA

In order to further the safety and health program and to avoid duplication of effort, close cooperative working arrangements have been developed with official and semi-official organizations which are already operating in the safety field. A plan has been worked out with the American Standards Association whereby the work of this Division will be largely confined to subjects not yet covered by the American Standards Association, and for the most part will be restricted to the field of occupational disease hazards. A clearance arrangement with the American Standards Association will assure critical analysis and expert appraisal before promulgation of any codes that are adopted.

A constructive venture of the Division has been the inauguration of a program of training schools for factory inspectors. The first school, which was held in Baltimore from February 10th to February 20th, in cooperation with the School of Hygiene of Johns Hopkins University, was attended by 27 inspectors from Maryland and the nearby States of North Carolina, West Virginia, and Tennessee, and proved extremely successful.

Two experienced officials from the New York State Department of Labor—John W. Willis, Assistant Superintendent Industrial Inspection, and H. L. Reid, Safety Engineer, Division of Industrial Hygiene—together with R. P. Blake, Safety Engineer, and Dr. R. R. Jones, Medical Officer of this Division, led the discussions on inspection methods and safety and health standards, and brief lectures were given by a number of specialists in occupational diseases and industrial hygiene.

Primary emphasis was placed upon practical information gained by visits to factories and industrial plants in the Baltimore area. A portion of each day was devoted to inspection of selected units and the following morning sessions were given over to a discussion of the observations made in these plants, bearing on the adequacy or inadequacy of protective safety devices, lighting, ventilation, and kindred subjects. In this manner it was possible to provide a concrete basis for discussion and an interchange of ideas on industrial hazards and safety problems as they applied to specific lines of industry.

The development of a comprehensive program for the control of silicosis and similar dust diseases is now one of the more important problems engaging the attention of this Division. Preliminary conferences, attended by representatives of the American Standards Association, the Air Hygiene Foundation, U. S. Public Health Service, Bureau of Mines, National Safety Council, leading trade associations, important insurance companies, and leaders of the building trade unions, United Mine Workers and other unions, have been held and invitations have been sent out for a national conference of all groups interested in this problem for April 14.

It will be the aim of the national conference to appraise accurately the actual hazards to workers in industry, as well as to formulate a definite and sound policy of supervision and control.

Exhibits

The Division of Labor Standards has the entire responsibility for assembling exhibits for the Department of Labor. In this work it is served by an advisory committee representing the different bureaus. Exhibits on safety and health have been prepared for a number of state safety meetings, and there is an increasing demand for the use of these exhibits by State labor departments.

Standardization

If you think of "standardization" as the best that you know today, but which is to be improved tomorrow—you get somewhere.—Henry Ford, *quoted by the Nickel Cast Iron News, March, 1936.*

labor groups, and national trade and industrial associations interested in accident prevention and occupational disease control.

A special exhibit was prepared for the California Pacific International Exposition, San Diego, California, which closed November 11, 1935, and this Division will have the entire responsibility for the U. S. Department of Labor exhibit at the Texas Centennial Exposition, opening June 6, 1936, at Dallas, Texas.

Creosote Standard Protects User, Says Australian Association

A draft specification, to help prevent adulteration of coal tar creosote when used as a wood preservative, has been issued by the Standards Association of Australia.

Coal tar creosote is closest to an ideal preservative, but it has frequently been adulterated by the addition of tar, petroleum oil, and in some cases, used sump oil. These substances have little, if any, preservative value, and they adversely affect the handling and painting of the treated material. The Council for Scientific and Industrial Research of Australia recommends, therefore, that the user of creosote should safeguard himself by purchasing the preservative from reputable firms which give a guarantee that their product conforms to this draft specification.

Following is the draft Australian Standard Specification for creosote oil for general wood preservation purposes:

1. *Description*: The oil shall be a distillate of coal tar.
2. *Specific Gravity*: 38C as compared with 15.5C, not less than 0.94.
3. *Water Content*—not to exceed 3%.
4. Matter insoluble in benzol not to exceed 0.4%.
5. *Distillation*:—
   Up to 210C not more than 10%.
   Up to 235C not more than 35%.
   Up to 315C not more than 85%.
6. *Residue*—over 355C if it exceeds 5% shall have a float test of not more than 50 seconds at 70C.
7. *Coke Residue* not to exceed 2%.
8. Tar Acids—not less than 5%.

New Standard Gives Dimensions For Socket Screws and Wrenches

Six tables of dimensions for hexagonal and fluted socket set screws and cap screws, and dimensions of wrenches to be used with them, have been approved by the American Standards Association as American Standard B18.3-1936.

An appendix to the standard gives the formulas for these dimensions.

The standard was developed by Subcommittee 9 of the ASA Sectional Committee on Bolt, Nut, and Rivet Proportions (B18). Herman Koester, Works Manager, the Bristol Company, Waterbury, Conn., is chairman of the subcommittee, and John S. Cochran, president, Mac-It Parts Company, Lancaster, Pa., is secretary. Professor Arthur E. Norton, Harvard University, Cambridge, Mass., is chairman of the sectional committee.

A.S.T.M. Test Method Is Approved by ASA

The American Standards Association has approved the A.S.T.M. Standard Method of Test for Determination of Toluol Insoluble Matter and Rosin (chiefly Sand, Chips, Dirt, and Bark) (A.S.T.M. D 69-30).

This standard was originally prepared as the result of an investigation on methods for determining the presence of dirt and rosin by the American Society for Testing Materials' Committee D-17 on Naval Stores, in 1927. It was adopted by the A.S.T.M. in 1930 as A.S.T.M. standard D 69-30.

The American Standards Association approved the standard with the designation K21.1-1936.

Copies are available from the American Society for Testing Materials, 260 South Broad Street, Philadelphia, or from the American Standards Association, at 25 cents each.

British Standards Institution Issues Vegetable Oil Standards

Six specifications of a series of standards for vegetable oils have just been issued by the British Standards Institution. The new specifications are for coconut oil, ground nut oil, olive oil, rape seed oil, linseed oil for general purposes and sampling of fats and fatty oils. Limits are laid down in the specifications for impurities, color, refractive index, iodine value, saponification value and acidity, and standard methods of test for determinining these properties are included in appendices.

Other specifications in the series which are nearing completion are for castor oil, tung oil, refined cottonseed oil, crude palm kernel oil, crude maize oil and sesame oil.

Copies of the new specifications may be borrowed or purchased through the office of the American Standards Association.

National Bureau of Standards Tests Carpets' Wearing Quality[1]

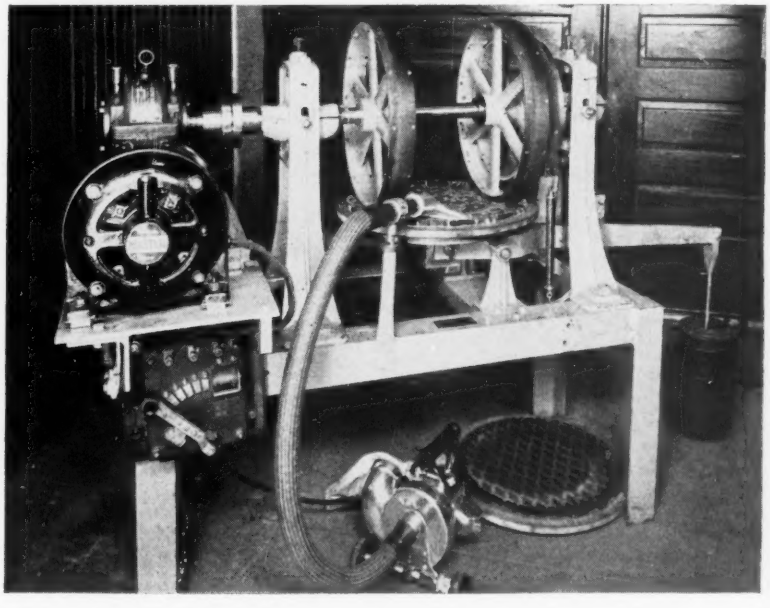
Wear Test for Carpets Is One of Scientific Tests on Quality Which May Form Basis for Consumer Goods' Standards

CARPETS and similar floor coverings are expected to be not only attractive in appearance and feel, but to be resistant to wear. The carpet-wear testing machine, illustrated in the accompanying photograph, has been developed at the National Bureau of Standards to simulate the wearing forces which act when a carpet is walked upon. The wearing forces of the machine produce bending, slipping, twisting, and compression of the pile fibers. The tips of the fibers are frayed and split. Some of the fibers are fractured in one or more places. The fibrils at the tips, cortical cells, or groups of cortical cells, and short segments of the fibers are broken off during a test. Microscopic examination of fibers taken from carpets after several years in service show similar wear.

A circular sample of the carpet to be tested is fastened to a turntable which is brought to bear against two leather-covered pulleys with a force of 135 pounds at each pulley. One of the pulleys is driven by a motor and in turn drives the turntable with a speed of 80 rpm. The other pulley is used as a brake to produce slipping of both pulleys on the carpet as it rotates. The braking torque is 7.5 foot-pounds. A vacuum cleaner removes the material which is worn off. The wear is evaluated by measuring the change in thickness of the pile as the test proceeds with a thickness gage having a circular foot 1 inch in diameter and exerting a pressure of 0.75 pounds per square inch. The test is discontinued when the pile is worn down to one-fourth of the original pile thickness. The number of thousands of revolutions of the turntable required to wear the pile of a carpet down to one-fourth of the original pile thickness is taken as the wear index of the carpet. The wear indices of carpets correlate well with the available indices based upon the reputation of similar carpets in service.

The following summary is based upon the in-

[1]Publication approved by the Director of the National Bureau of Standards of the U. S. Department of Commerce.



Testing machine used at the National Bureau of Standards to determine resistance of carpet to wear similar to that when carpet is in actual use.

The circular piece of carpet on the floor below the machine has already been tested and shows the effect of the test.

formation reported in National Bureau of Standards Research Paper RP640:

The density of the pile appears to be the predominant factor of a carpet which affects its wear. The height of the pile is of lesser importance. The quality of pile wool has a measurable effect while the types of pile anchorage studied have no appreciable effect. In general, the wear index of a carpet is approximately proportional to the product of pile density squared and pile height. Underlays increase the durability of carpets. The increase in wear index depends upon the underlay and the carpet. The composition, thickness, density, and compressibility of underlays are factors which contribute to their effectiveness. Underlays are more effective when used with carpets of short pile than when used with carpets of long pile.

Revival in Automobile Industry Renews Interest in Standards

THE pronounced revival in the automotive industry during the past year has brought with it revived activity in the standardization work of the Society of Automotive Engineers, C. W. Spicer, chairman of the S.A.E. Standards Committee, reports.

"The many innovations in automobile design and manufacture have brought a corresponding need for revisions and modernization of many of the older established standards and these are in progress, to be reported on finally during the coming year as soon as they can be completed and approved by the industry at large," Mr. Spicer said. "In view of this revived activity it is recommended that the standardization activities of the Society be given careful attention by the engineering and production men of the industry during the coming year in order to carry this important work forward as rapidly as possible and make the results of it available for general use by the industry as quickly as possible."

New Tractor Division

Reporting on actions taken by the committee during the past year, Mr. Spicer said that several projects relating particularly to the agricultural and industrial tractor industry have led to the organization of a Tractor and Equipment Division of the Standards Committee.

During the year a considerable number of important projects became active, among them revision of the spline type of airplane propeller hubs and shaft ends, ball bearing standards, Diesel engine testing forms, storage battery tests, engine testing forms, fan belts and pulleys, sparkplugs, automobile headlight specifications, automobile aircraft and motorboat electric light bulbs, crankcase oil viscosity classification, a classification for chassis lubricants and standardization of lubricating fittings, motorboat shaft couplings and fuel and lubrication tube fittings.

Specifications for the flared type of fuel and oil tube fittings were revised and several of the older production engineering standards were modified in the light of current requirements.

A new bronze bearing alloy was reported but referred back for further consideation.

Definite action was taken to cancel the old American Standard specifications of 1922 for dual beam headlights, and a number of specifications relating to automobile lighting equipment which had become obsolete were also cancelled.

The Society is continuing its active participation in the work of sectional committees under the procedure of the American Standards Association, including the new committee on the inspection code for motor-vehicles.

The Standards Committee is also cooperating on joint committees or by representation on committees of other organizations such as the Army-Navy Standards Conferences, the American Society for Testing Materials, American Society for Metals, the Radio Manufacturers Association, and a number of others whose activities are of more direct interest to the automotive industry.

British Standard Gives Test Methods for Glue

A series of standard methods for the testing of glue has just been issued by the British Standards Institution.

The tests include methods for the determination of moisture content, jelly strength, viscosity, melting point, foam, water absorption, keeping quality, joint strength in shear, reaction, grease, ash, sulphur dioxide, and chlorides, for bone, skin, and fish glues.

Copies of the standard (B.S. 647, 1935) may be obtained from the American Standards Association.

Railway Engineering Association Elects A. R. Wilson President

Importance of Standards to Railroads Emphasized at Annual Convention

A. R. WILSON, engineer of bridges and buildings, Pennsylvania Railroad, Philadelphia, alternate on the ASA Standards Council for the Engineering Division of the Association of American Railroads, was elected president of the American Railway Engineering Association at its Thirty-seventh Annual Convention, March 10, 11, 12 at Chicago.

J. C. Irwin, chairman of the Standards Council of the American Standards Association, was named first vice-president.

The address of the retiring president, R. H. Ford, Assistant Chief Engineer, Chicago, Rock Island, Pacific R. R., stressed the importance to railroads of the extensive research program which the A.R.E.A. has continuously promoted. As a logical sequel to research, Mr. Ford emphasized the constant work in revision of the Manual and in development of new specifications. A new edition of the Manual will be published soon.

New Specifications Important

Among the new specifications of particular importance to the railroads are those covering the design of steel railway bridges and concrete railway structures published by the A.R.E.A. under the auspices of the Association of American Railroads. These specifications were prepared to meet an increasing need for standardized work on bridge design and construction. Bridges represent approximately 13 per cent of the roadway investment of railroads on which annual expenditures amount to around $23,000,000. The A.R.E.A. Committee on Iron and Steel Structures estimates important savings from the new specifications and adds that further savings could be made if the necessary scientific data on the true effect of impact on railway bridges were available.

Important research problems on rail service and water for rail purposes were also discussed. The first of these problems is being carried out largely by the Committee on Rails working jointly with the Railway Manufacturers' Technical Committees and the Engineering Experiment Station of the University of Illinois.

In accordance with recommendations from the Committee on Rails there were adopted revisions in several sections in the Manual, and existing specifications were replaced by new specifications for heat-treated carbon steel and alloy steel track bolts, high-carbon steel jointed bars, and quench carbon steel bars.

Reports on rail-failure statistics for 1934 were also presented and discussed.

Studies of treatment of locomotive boiler waters by the Committee on Water Service indicate that annual savings of not less than $12,000,000 can be made by further improved methods for the conditioning of water to make it more suitable for boiler purposes.

The Committee on Roadway recommended the withdrawal of A.R.E.A. specifications for cast-iron culvert pipe and, pending further consideration, that A.S.T.M. Specification A 142-43 T be used.

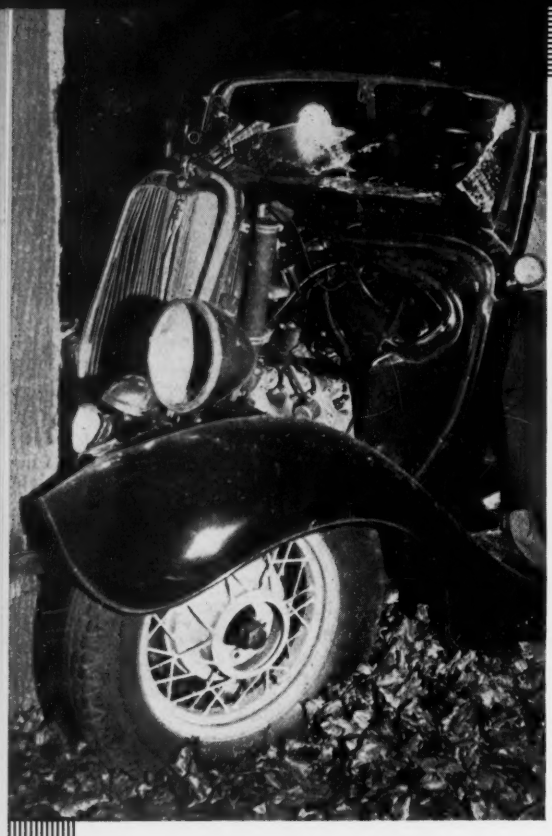
Revised specifications for corrugated metal culvert pipe were also adopted.

The main feature of the report of the Committee on Standardization was the formulation of a list of A.R.E.A. recommended practices, which the several committees of the Association agree should be advocated for general use on the railways. Closer cooperation between the A.R.E.A. and the various committees of the A.S.T.M. was also urged.

An investigation recently made by the Committee on Ties to determine adherence to A.R.E.A. Specifications for Ties (American Standard 03-1926), indicated that the most important factor in complying with provisions of the standard law in the inspection of the ties before purchase. More uniform inspection was considered desirable.

Amend Specifications for Wood

An important provision in the Manual prepared by the Committee on Bridges and Trestles was the adoption of amended specifications for wood for structural use under the general heading of Grading Structural Timbers on the Basis of Unit Working Stresses—1936." (For a discussion of these specifications see INDUSTIAL STANDARDIZATION, November, 1935, p 319).



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